

Meeting Content

Message from the Division

Slide 1

Public interest in the Indiana Gypsy Moth Management Program is highly encouraged because ultimately either gypsy moth infestations or the actions taken to control them will affect homeowners and other citizens. The Indiana DNR's Division of Entomology & Plant Pathology holds public meeting in places where enough gypsy moths have been trapped to indicate that management of the insect is needed. Public comments on proposed treatments may be sent to the DNR through February 19th

Slide 2

Agenda

Slide 3

Biology

Slide 4

The gypsy moth goes through 4 life stages: egg, larva, pupa, and adult.

Slide 5

Egg mass

Egg masses are deposited by female moths in late summer in crevices of trees and in other hidden places. Each egg mass contains 500 – 1000 eggs. In early May in northern Indiana, tiny caterpillars hatch from the egg masses.

Slide 6

Hatching caterpillars

Newly hatched caterpillars move to the foliage in the upper part of the tree and begin to feed. If crowded, the tiny caterpillars spin silk threads and which catch the wind and carry them to another tree or hilltop in a process called ballooning.

Slide 7

Feeding caterpillars

As caterpillars feed from late April through June they grow larger and larger. As they grow, their distinct features and markings become increasingly evident. Older caterpillars are quite hairy and marked with 5 pairs of blue dots followed by 6 pairs of red dots down their backs.

Slide 8

Feeding habits

The Early instars feed during the day. Late instars feed at night. They crawl down from the foliage and find shelter during the day. The last instar feeds 24 hours. A late instar caterpillar can eat a square foot of leaves in a 24-hour period. They can eat 11 square feet of foliage during their entire caterpillar stage.

Slide 9

Pupae

Caterpillars stop feeding in June and enter the pupal stage - the resting stage between caterpillar and adult stages... Gypsy moth pupae are covered with brown, tear-drop shaped protective shells about 1 to 2 inches long covered with hairy bristles. Caterpillars seek hidden spots in which to pupate for protection from predators and parasites. The pupal stage lasts from 10 - 14 days

Slide 10

Adult moths

Male moths emerge from their pupal cases first in early July. Females emerge three to five days later. The males have feathery antennae and are dark brown with an inverted V mark pointing to a dot on their wings. Females have similar wing markings but are lighter in color, larger, have simple antennae, and do not fly. Each female produces a pheromone that attracts males.

Slide 11

A female moth depositing an egg mass.

Slide 12

Damage

Slide 13

Images of defoliation

Slide 14

Concerns about Gypsy Moths

Slide 15

Host Range

Slide 16

Defoliation

Reduces a tree's ability to produce and store food.

- The tree begins to decline.
- Branches and limbs begin to die.
- The tree becomes more susceptible to attacks from diseases and insects.
- Death may occur after just 2 years of 50% defoliation.

Slide 17

Damage to forests

- Decreased vigor and decline of host trees.
- Reduces Timber value.
- Defoliation opens the forest canopy and exposes the forest floor.
- Species composition change occurs when dead trees are replaced by hosts less favored by the gypsy moth.
- Forest floor dries in spring. Seed germination may decline.
- Dead limbs and trees increase the fire load – forest fires spread faster.
- Reduces recreational uses and value.

Slide 18

Gypsy moths in urban landscapes

- Trees are already stressed
- Homeowners are liable for fallen limbs, tree removal costs, and replacement costs property values go down.
- Trees cool the air in the summer, block wind, buffer noise, clean the air, and provide homes and shelter for wildlife. If removed these ecological benefits will be lost.

Slide 19

Gypsy moth caterpillars coating a house

- Thousands of crawling caterpillars may be present when populations are high.

Slide 20

Gypsy moth caterpillars and their excrement

Slide 21

Allergic reactions are possible.

Slide 22

Surveys

Slide 23

- Several states along the leading edge of the infestation set traps for the male moths.
- Indiana sets traps on a grid system across the entire State.

Slide 24

There are two purposes for traps – detection of new populations and monitoring of existing populations.

- Traps are baited with the female sex pheromone to attract male moths.

Slide 25

2009 male moth catch by county

Slide 26

Surveys for egg masses

Surveyors select sites to look for egg masses based on results from trapping surveys. Trapping data, trapping history, presence of egg masses, host availability, distance to the generally infested area, potential ecological threat will all help determine what treatments are needed to manage gypsy moth in an area.

Slide 27

Treatment options

Slide 28

The “Moth Line”, 2005-2009

As this map demonstrates, gypsy moths have been mostly restricted to the far northern part of Indiana for the last several years.

Slide 29

Slow the Spread

Why Slow the Spread of Gypsy Moth

- Though gypsy moth will never be totally eradicated movement can be slowed down.
- New technology is becoming available.
- Slowing gypsy moth allows time for the natural enemies to naturally keep populations down over longer periods without human intervention

Slide 30

Natural enemies of gypsy moths

- Predators – feed on gypsy moth life stages.
- Pathogens –bacteria, fungi or viruses that infect gypsy moths, in the end killing the insect.
- Parasitoids – other insects, usually tiny wasps, which reproduce inside gypsy moths and eventually kill their hosts.

Slide 31

Treatment options

- No action: Populations will increase and spread.
- Mass trapping, burlap banding and other mechanical controls, spraying of egg masses: successful only when moth populations are very low.
- Btk (aerial application): very effective on low level populations
- Mating disruption with female pheromones (aerial application): effective on very low level populations.

Slide 32

Proposals

Slide 33

Conditions considered when proposing a treatment

- Hosts in the area.
- Distance from the generally infested area.
- Potential ecological threat.

Slide 34

Bacillus thuringiensis (Btk)

***Bacillus thuringiensis* variation *kurstaki* (Btk)** is a natural occurring soil bacterium. When the caterpillar ingests it, the Btk forms a sharp crystal in the caterpillars gut, interrupting the insect's feeding and eventually killing it. Btk only affects caterpillars. It is nontoxic to humans and other mammals and is most efficiently applied from the air.

Slide 35

Mating disruption

Reduces future reproduction by interfering with male gypsy moths' ability to find mates. Does not kill living organisms.

Slide 36

Security precautions for aerial treatments

- Material will be secured before, during, and after the operation.

- The plane will be secured.
- The DNR will have personnel monitoring from the ground and at the airport.

Slide 37

Comments